

## REMARKS/ARGUMENTS

Claims 1-12 are pending. Claims 13-17 are withdrawn.

The applicant affirms the election of Group I, claims 1-12.

The Examiner rejected claims 1-12 under 35 U.S.C. 112, second paragraph, as being indefinite. **Regarding claims 1, 7, and 12**, the Examiner stated that the term "preferentially desorbing" is vague and confusing as to what preferentially means, and that clarification and/or appropriate amendments are requested. Claim 1 clarifies the term "preferentially desorbing" by the limitation that the "preferential desorbing" is of "an unreacted species" with the limitation of "leaving a layer of the first product." This is supported by FIG. 1, step 116, and page 4, line 27, to page 5, line 3, of the application. This passage describes the preferential desorption of the unreacted first reactive species and leaving a layer of the first product. It is stated that this may be done by heating to a temperature where the vapor pressure of the first reactive species is much greater than the vapor pressure of the first product. This is further supported on page 5, lines 19 to 30, which describes FIG.'s 2-4. In this passage and these figures, it is explained that first reactive species  $\text{AlCl}_3$  molecules 212 of FIG.'s 2 and 3, have a vapor pressure at  $58^\circ\text{C}$  of approximately 7 mTorr, where the first product  $\text{AlF}_3$  308 of FIG.'s 3 and 4 would need to be heated to about  $744^\circ\text{C}$  to have a comparable vapor pressure. The substrate temperature is raised to about  $100^\circ\text{C}$  and a high vacuum is maintained to preferentially desorb unreacted  $\text{AlCl}_3$  404 in FIG. 4, while leaving the layer of  $\text{AlF}_3$ , as illustrated in FIG. 4, due to the differences in vapor pressure. Thus both the claims and the specification clearly describe how preferential desorption is able to desorb unreacted reactant preferentially to the first product. For at least these reasons, claims 1, 7 and 12 are not indefinite.

**Regarding claims 3, 4, and 8**, the Examiner stated that the term "simple vapor deposition" is vague and confusing as to what "simple" means. Page 4, lines 20-22, of the application states that when a vapor is created by heating from a solid or liquid form and is physisorbed it is called simple vapor deposition. Since the specification clearly defines simple vapor deposition as a vapor created by heat from a solid or liquid form and which is physisorbed,

the term "simple vapor deposition" is not indefinite. For at least these reasons, claims 3, 4, and 8 are not vague.

The Examiner rejected claims 1-12 under 35 U.S.C. 103(a), as being unpatentable over Soininen et al. (6,482,740) or Hasegawa et al. (5,746,826).

**Regarding claim 1**, Soininen, col. 6, lines 26-39, disclose a low volatility oxide of a metal, as the first reactive species deposited on the substrate and that this low volatility oxide of a metal is at least partially converted into a metal by providing a reducing agent. Such a low volatility oxide would be difficult to desorb and more difficult to preferentially desorb.

In addition, col. 16, lines 61-62, of Soininen, cited by the Examiner, does not teach or suggest desorbing the unreacted reactive species. Col. 16, lines 61-62, of Soininen, cited by the Examiner, states that mild oxidizing agents are used, since strong oxidizing agents tend to create  $\text{RuO}_4$ , which is highly volatile and thus the growth of  $\text{RuO}_2$  is disturbed by the desorbing  $\text{RuO}_4$ .  $\text{RuO}_4$  is not unreacted reactive species, as recited in claim 1, but instead a by product of a reaction. The example in the cited passage does not teach using desorption to form monolayers, but instead the example in this passage teaches that strong oxidizing agents should be avoided to avoid the desorption of  $\text{RuO}_4$ , since it interferes with the growth of  $\text{RuO}_2$ . Thus, Soininen teaches away from desorbing.

Hasegawa fails to teach chemically reacting the layer of the first reactive species with the second reactive species to create a first product, as recited in claim 1. Instead, Hasegawa teaches in col. 3, lines 59 to 64, teaches that the second element grows on the surface of the substrate, but not on the thin film of the first element. Since the Examiner failed to point out any chemical reacting of the first reactive species with the second species to create the first product, Hasegawa cannot teach desorbing unreacted species leaving a layer of the first product, as recited in claim 1.

The Examiner further stated that the references fail to teach "preferentially desorbing", but that the references clearly teach desorbing and that it would be obvious the preferentially desorbing would result in a similar product and that it would be obvious to preferentially desorb the given references' teaching of desorption with the expectation of obtaining similar results.

The references do not teach or suggest desorbing unreacted reactive species leaving a layer of the first product formed from chemically reacting the first reactive species with a second

reactive species. Neither reference suggests having similar results. Soininen avoids desorption, teaching that desorption of one product would hurt the formation of another product. Therefore Soininen teaches away from and avoids desorption, instead of uses desorption. Therefore, Soininen does not suggest the same results using preferential desorption. Since Hasegawa does not teach a first product formed from chemically reacting the first reactive species with the second reactive species, the Applicant cannot see how Hasegawa can suggest a preferential desorption of the unreacted reactive species and leaving the first product to obtain the same results. For at least these reasons, claim 1 is not made obvious by the cited references.

**Claims 2-12** are ultimately dependent on claim 1, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to claim 1. Additionally, these dependent claims require additional elements that, when taken in the context of the claimed invention, further patentably distinguish the art of record. For example, claims 7 and 12 further recite depositing a second layer of the first reactive species, chemically reacting the second layer of the first reactive species with the second reactive species to create the first product and then preferentially desorbing unreacted first reactive species leaving a second layer of the first product. For at least these reasons, claims 2-12 are not anticipated or made obvious by the cited references.

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at telephone number (831) 655-2300.

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